

Tempe Fire Department Policies and Procedures

Support Activities

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Tactical support activities are those functions that assist fire control and rescue operations. They generally include: forcible entry, ventilation and the provision of access. Many times confusion on the fireground is the result of a lack of such support functions and does not generally relate to a breakdown of basic water application activities. Command must cause these support functions to be completed in a timely and effective manner - the end of the nozzle must be supported.

VENTILATION

Buildings are ventilated principally for two reasons:

- To prevent mushrooming.
- To gain (and maintain) entry.

The timing of ventilation becomes extremely important and must be coordinated with fire attack activities - ventilation should be provided in advance of attack lines. Portable radio communications between engine and ladder companies facilitate this interaction.

Vertical Ventilation

Vertical ventilation effected as close to being directly over the fire as possible, is the most effective form of ventilation in working interior fire situations.

Fire will naturally burn out of holes in roofs, regardless if you cut the hole or if the fire does. If the fire burns through the roof (defensive ventilation) it will generally do so in the best location - directly over the fire. If ladder companies cut the roof, they must locate ventilation holes in a manner that will support rescue activities and fire confinement. If vent holes are cut in the wrong places, the fire will naturally be channeled to them and expand the loss.

When you cut a hole in a roof, cut a big one, always keeping in mind proper cutting techniques, such as making an inspection hole, etc.

We ventilate to alter interior conditions. The best operating position to determine if a building requires ventilation, and the location and timing of that ventilation is the inside sector. Interior and roof forces must communicate in order to coordinate the effort effectively.

Do not operate hose lines, particularly ladder pipes, down ventilation holes. Be cautious of hose lines to roofs - "candle moth" syndrome tends to overpower personnel operating on roofs when fire and smoke come out vent holes. Operate roof lines only for the purpose of protecting personnel and external exposures unless Command orders a coordinated roof attack.

Effective topside ventilation will tend to keep roofs intact longer, and roof condition necessarily becomes extremely important to ventilation activities. If ladder crews cannot get on the roof to ventilate because of advanced fire, Command had best begin to react in marginal offensive/defensive terms. Hose line crews can probably get inside, and stay inside longer, than ladder crews can stay on the roof. Axiom: It is better to abandon the building a bit too soon rather than a bit too late.

On any commercial, or large area roof, the aerial should be used as a primary ladder. A secondary ladder (means of escape) should also be placed on large roofs. All ladders should be placed at the strongest portion of the roof/wall, i.e., corners, pilasters, hips, and valleys.

A roof ladder will be taken to the roof with the crew. This ladder is not necessarily to work off of, but to span weak areas, rescue someone who has fallen through, emergency escape, etc.

Horizontal Ventilation

Horizontal ventilation will probably suffice in most residential fires. This can be done from the interior by the search crew using windows in each room. If possible, when ventilating horizontally, open from leeward side high, then windward side low.

Positive Pressure Ventilation

Positive pressure ventilation is a technique that uses high volume fans to move smoke, heat, and fire gases out of a building and cool air in.

Positive pressure ventilation (PPV) has many benefits to fire operations. They include:

- Rapidly removes heat and smoke from the building, thus reducing the fire's ability to propagate and advance.
- Causes an improving atmosphere - thus improving patient survivability profiles.
- Rapid removal of smoke improves firefighter's ability to conduct search and rescue operations as well as effective salvage operations.
- The improved atmosphere and visibility increases the firefighter's ability to conduct the attack/extinguishment operations.
- The improved atmosphere reduces firefighter heat stress.
- Reduces smoke and fire damage to the structure.
- Can reduce the need and risk of roof ventilation at many fires.

All ladder companies are equipped with high volume positive pressure fans. Most offensive fire operations qualify for early application of PPV. Command should order PPV where appropriate and early in the operation. Ladder companies should expect to apply PPV and crews should dismount apparatus planning to take fans to the fire scene.

Positive pressure fans should be placed at the point of entry(s) from the unburned side of the fire. Fans should be positioned 12-15 feet back from the entry point. The objective is to create a pressure "cone" effect around the door. This position will also allow access for crews to enter the building.

Where additional fans are required, placing two or more fans in "tandem" - one behind the other is more effective than side-by-side.

Positive pressure ventilation is effective only when applied properly. Two major items are required:

1. An "exit" for the pressurized air must be provided and must be located in the fire area. This is generally a window, door, or other opening.
2. Positive pressure ventilation must be injected from the unburned side of the fire.

It will be the ladder company officer's responsibility to ensure that these two requirements are completed prior to injecting positive pressure into the structure.

Air flow from PPV must be controlled throughout the operation. Too many openings or exit points reduce the effectiveness of PPV. In some cases, windows and doors that are already open may need to be closed to direct the air flow into the fire area, or the most densely affected smoke area.

As one area is cleared of smoke, that area may need to be sealed off and another exit created in another area of the structure to direct the air flow into the next area to clear.

Isolated attic fires can benefit from PPV. During initial attack, fire crews should use small openings in the ceiling for water application. This will prevent the clear environment below the ceiling from rapidly filling with smoke. Moving from one room to another and "punching" the nozzle through the ceiling and using a fog application is very effective. Use of penetrating nozzles is also recommended.

An "exit" for PPV in the attic must be in place. Most roofs/attics have pre-existing vents typically at the end of the attic space in a vertical wall. These are often adequate for an "exit."

Some structures may have a "sealed" attic space with no in-place vent openings. In this case, opening a vertical wall on one end of the attic or cutting a vent hole in the roof may be required. If pre-existing vents are too small, they may need to be enlarged.

Multi-story or highrise fires require greater coordination and additional fans.

Stairwells should be used to direct air flow from PPV. An exit for the exhaust must be obtained. A roof door is appropriate.

Multiple fans may be required. Two or more fans may be needed at the base of the building. Additional fans may be needed on landings at various levels in the stairwell. A fan will be needed at the entry to the fire floor.

Multi-story and highrise positive pressure ventilation is complex. A ventilation sector should be established to coordinate all aspects of PPV on all floors.

Buildings with large square footage may require multiple fans, perhaps at more than one location to effectively remove smoke. These situations are more complex and require close coordination of PPV with all sector officers. Command should consider a ventilation sector to coordinate all ventilation operations in large buildings.

Positive pressure ventilation can create problems if not effectively managed, monitored, and coordinated. Be aware of the problems listed below and take appropriate corrective action.

- There must be an exit in the burned area or the fire may be pushed into unburned portion.
- Because of positive pressure, a "blow torch" effect of fire blowing far out of the exit may occur. This is normal and predictable. Adjacent exposures may need to be protected.
- Do not direct a fire stream into an operating PPV exit point.
- All concealed spaces need to be checked for extension.
- Ladder company officers and/or sector officers will be responsible for monitoring and coordinating the application of PPV.
- Gas powered fans produce carbon monoxide and breathing apparatus may be required when PPV is used during overhaul operations.

FORCIBLE ENTRY

Forcible entry involves a trade-off in time versus damage; the faster you force - the more damage you do. The more critical the fire, the less important forcible entry damage becomes and vice versa. If the fire is progressing and you must go in and attack from the unburned side, don't waste time trying to pick the locks - bash the doors.

ACCESS

The provision of access many times will determine if the fire is cut off and extinguished or not. These access-oriented activities generally involve pulling ceilings, opening up concealed spaces and voids, and the activities required to get fire attack forces in to operate on hidden fire. Such operations beat up the fire building and must be done in a timely, well-placed manner. In such cases, do not hesitate - if you size-up fire working inside a concealed space, get ahead of it, open up, and cut it off.

Beware of the premature access efforts, such as opening of doors, holes, etc., before lines are placed and crews are ready to go inside. Good timing requires effective communication between engine and ladder companies.